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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------|------------------|
| 10/614,927 | 07/08/2003 | Cheng T. Horng | HT00-023B | 9223 |
| 7590 09/27/2004 | | | EXAMINER | |
| George O. Saile 28 Davis Avenue Poughkeepsie, NY 12603 | | | MAGEE, CHRISTOPHER R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2653 | |

DATE MAILED: 09/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---|-------------------------------------|--|
| Office Action Summary | Application No. 10/614,927 | Applicant(s) HORNG ET AL. | |
| | Examiner Christopher R. Magee | Art Unit 2653 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-15 is/are allowed.
- 6) ☒ Claim(s) 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/14/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being obvious over Horng et al. (hereinafter Horng) (US 6,466,418) in view of Yang et al. (hereinafter Yang) (US 6,452,757).

The applied reference has at least 1 common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or

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subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

2. Regarding claim 8, Horng teaches magnetic read head, comprising:

a bottom magnetic shield 40;

on said bottom magnetic shield, a first layer 42 of aluminum oxide;

a spin valve structure (col. 5, lines 1-20) whose top layer is a free layer 47;

a second layer 52 of aluminum oxide; and

an upper magnetic shield layer 60, thereby completing the manufacture of a spin valve structure.

Horng does not exemplify the first layer of aluminum oxide, having a thickness between about 40 and 60 Angstroms, a first layer of an insulating material having a dielectric breakdown voltage that is at least 5 times that of aluminum oxide, whereby said first aluminum oxide and high voltage breakdown layers together constitute a lower dielectric layer whose total thickness is less than about 150 Angstroms; on said free layer, having a thickness between about 40 and 60 Angstroms, a second layer of an insulating material having a dielectric breakdown voltage that is at least 5 times that of aluminum oxide; on the second high voltage breakdown layer, a second layer of aluminum oxide having a thickness between about 80 and 120 Angstroms, thereby forming, together with said second high breakdown layer, an upper dielectric layer whose thickness is between about 140 and 160 Angstroms; and on the upper dielectric layer, an upper magnetic shield layer, whereby the magnetic read head having a minimum separation between its upper and lower magnetic shields that is less than 700 Angstroms.

Yang shows dielectric gap layers 304 and 305 can be formed by depositing dielectric material on an underlying layer (i.e., on top of layer 303 or on top of a layer of the sensor 310). Ideally, the material used for a gap layer 304 and 305 should exhibit a high breakdown voltage, a low current leakage and good adhesion to the underlying layer as well as good adhesion with layers applied on top of the gap layer (col. 3, lines 14-26). Figures 4A through 4C show multiple dielectric layers wherein thicker and/or thinner layers can be used (col.3, lines 49-54).

Yang does not set forth the dimensions in these claims. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the bottom spin valve of Horng with the claimed dimensions through routine experimentation and optimization in the absence of criticality.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the bottom spin valve of Horng with the dielectric layers of Yang.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to manufacture the bottom spin valve of Horng with the dielectric layers of Yang in order to provide electrical and magnetic interference protection along with corrosion resistance (Yang et al.; col. 1, lines 58-67).

3. Regarding claim 9, Yang teaches the high breakdown voltage material is selected from the group consisting of tantalum oxide, tantalum nitride, aluminum nitride, and zirconium oxide (col. 4, lines 5-11).

Allowable Subject Matter

4. Claims 10-15 are allowed. The following is an examiner's statement of reasons for allowance:

- Claims 10 and 13 specify a magnetic read head which requires "a pair of parallel first trenches that are separated by a first distance and that extend part way through the free layer" and "parallel to the first trenches, a pair of second trenches, and separated from each other by a second distance that is greater than said first distance, and extending downwards into said manganese-platinum layer, and filled with material suitable for use as conductive leads."

These features, in combination with other features of claims 10 and 13, are not anticipated by, nor made obvious over, the prior art of record of Horng et al. (US 6,466,418), Yang et al. (US 6,452,757) and Mino et al. (US 5,997,698).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (703) 605-4256. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

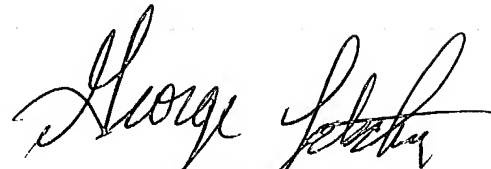


Christopher R. Magee

Patent Examiner

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September 17, 2004



GEORGE J. LETSCHER
PRIMARY EXAMINER